A Briefing on California

Water Issues

from the

Water Education Foundation

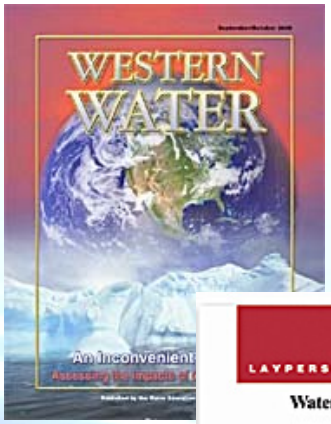
www.watereducation.org

Water Education Foundation
Who We Are

- More than 30 years of impartial public education on western water issues
- Volunteer Board of Directors representing diverse viewpoints
- Mission: to create a better understanding of water issues and help resolve water problems through educational programs

Publications: What We Do

- *Western Water magazine*
- *Layperson's Guides booklets*
- *River Report newsletter*
- *CA Runoff Rundown*
- *Maps and more*



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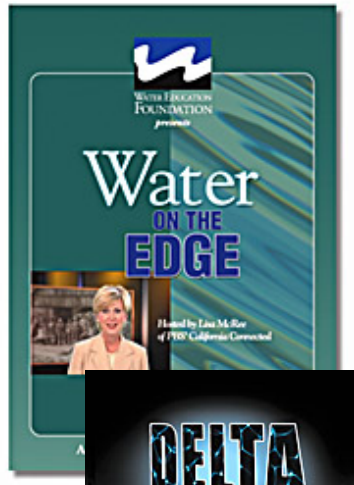
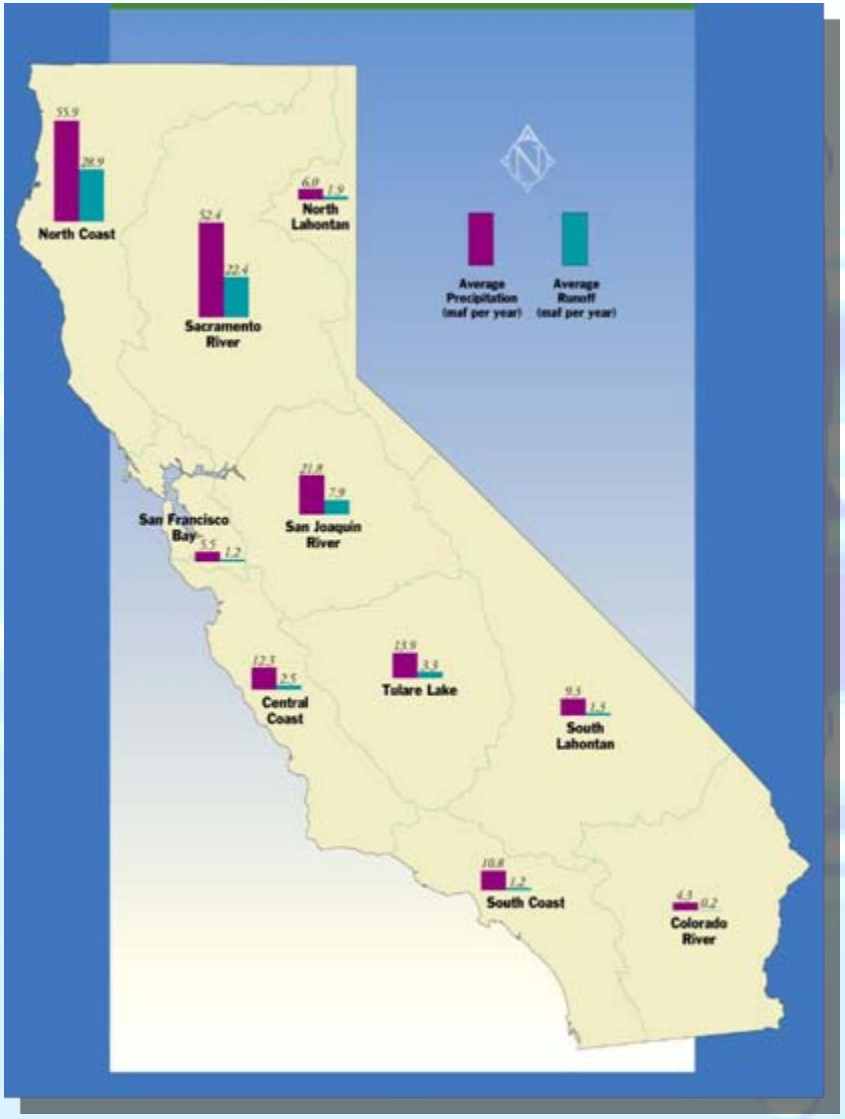
Outreach:
How We Do It

- Public television documentaries
- Water tours
- Public workshops
- Water Leaders class
- Teacher education programs
- Publications
- Website

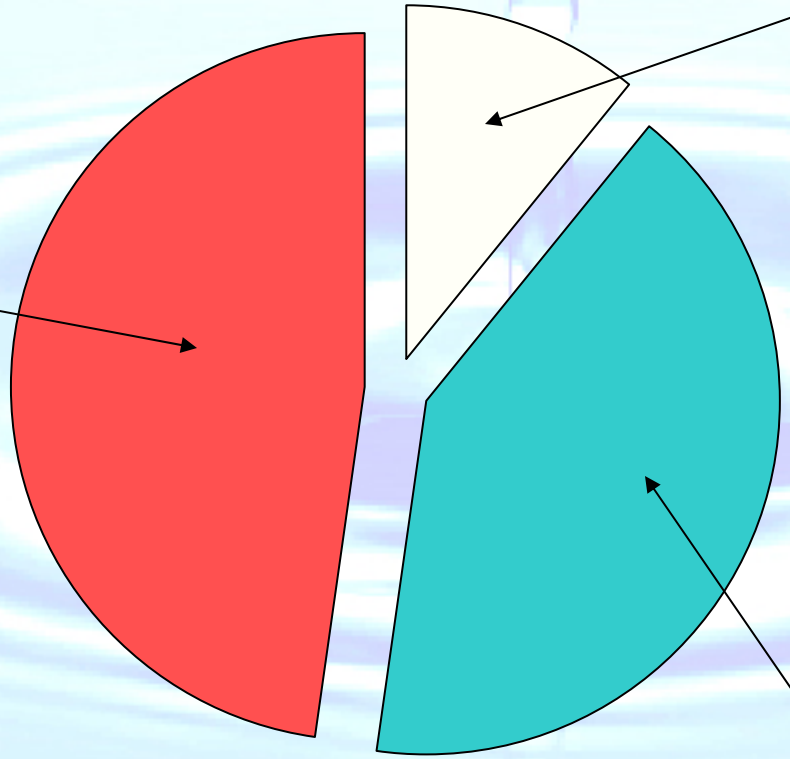


California Hydrology



- Mediterranean climate – dry summers, mild winters
- In average year, 82 million acre-feet of water used for agriculture, environment and cities
- More precipitation in north than south, reverse of population location

Major Uses of Water



2000 Water Year, defined as average

Acre Foot

An acre-foot covers 1 acre of ground – the size of a football field – 1 foot deep, and can meet the annual needs of 1 to 2 urban households.

Triad of Water Interests

Agriculture

Urban

Environmental

- Duels to influence policy
- Each deemed to have virtual veto over new projects or policy
- Alliances can shift

Major Water Issues

- Water sometimes not available when and where needed
- Intense disputes over water development, management
- Population growth

- Aging infrastructure needs maintenance, upgrades
- Need for more new supplies and diversification
- Supply shortfalls in water-short years
- Climate Change

Jones Tract, 2004

Point of Conflict: Delta Issues

- Drinking water for 23 million Californians, irrigation for millions of acres of farms in Central Valley

- Crumbling levees - flooding risks of farmlands, growing urban areas in Delta

- Fragile ecosystem – native fish crash

- Stakeholders divided on possible solutions – Peripheral Canal, barrier gates, pumping rates

Point of Conflict - Groundwater

- 30% - 45% of total supply
- Landowners enjoy almost unfettered right to use groundwater below their land
- Attempts to develop statewide groundwater management policy unsuccessful

Point of Conflict – Flood Management

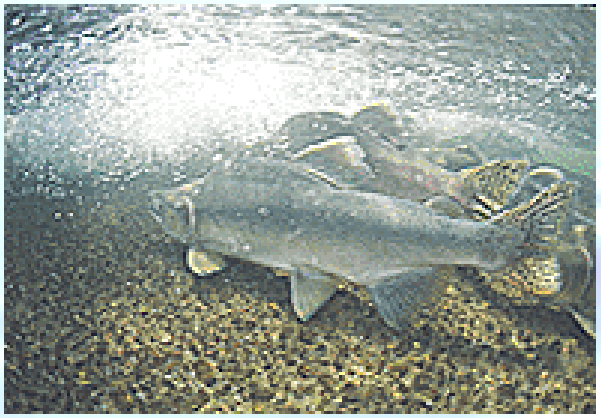
- Can levees and dams prevent major floods?
- Old, fragile levees - Delta and entire Central Valley
- Big concern with the finding of state liability for a 1986 levee break
- New Orleans flooding further heightened concerns

Sacramento Weir, 2005 (DWR)

What's happening now

- Bonds passed to improve Central Valley flood control system.
- Currently, levees protect 500,000 people and property valued at $47 billion.

Point of Conflict – ESA



- Endangered Species Act has required changes in water projects
- Chinook salmon decline

2002 = 775,000 spawning adults

2008 = 58,000 spawning adults

- Focus on habitat protection

Point of Conflict – New Water Sources

- Urban, agricultural interests often favor new storage facilities
- Environmentalists - more conservation, recycling, water reuse
- State Water Plan - stresses diversifying sources (e.g., recycling, desalination)

MWD's Diamond Valley Lake

Major Water Projects

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Federally Funded Projects

Shasta Dam

- 35 federally funded dams, reservoirs and canals. Built by U.S. Army Corps of Engineers and U.S. Bureau of Reclamation.

- **Central Valley Project** (CVP), which begins on the Sacramento River at Shasta Dam and ends near Bakersfield.

Federally Funded Projects - CVP

- 90% used to irrigate farms in Central Valley
- Some water to urban residents in the Bay Area

Financing

- **1902: Reclamation Act**
- **1982: Act increased to 960 acres**
- **1992: Act increased water costs to farmers, created water for environment**

State-Funded Projects - SWP

- State Water Project (SWP) consists of 29 dams and reservoirs and runs almost 600 miles from Northern to Southern California.
- Planned to deliver 4.2 million acre-feet; actually delivers about 3.1 million acre-feet.
- About half for farmers in the San Joaquin Valley and half for urban users in Southern California and the Bay Area.

Financing the SWP

- 1960 - $1.75 billion bond
- 29 contractors pay all costs, including bond interest, energy and transmission charges – whether water delivered or not.
- SWP generates about 2/3 of electricity needed to run its facilities.
- No acreage limitations.

San Luis Reservoir

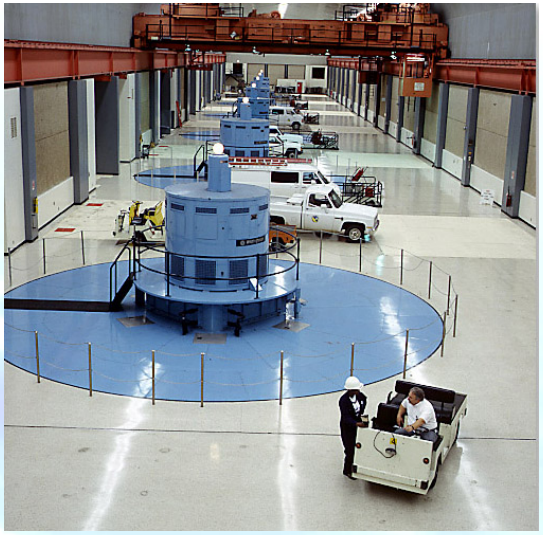
Water and Energy

- 20% of state's electricity used to bring water to consumers and send it away for sewage treatment.
- SWP is single-largest power consumer in California

- Installed pumping capacity is about 2,600MW

- SWP is the fourth largest power generator in California

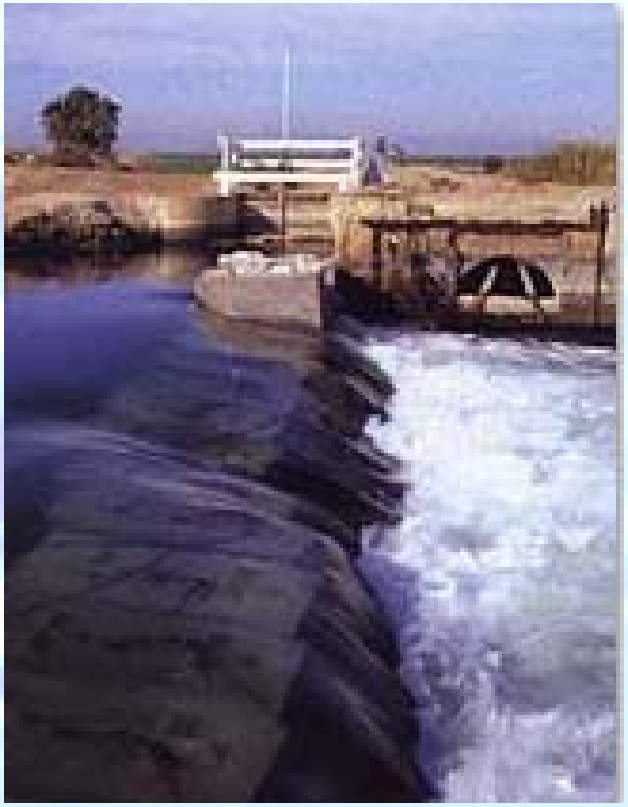
- Installed generation capacity is about 1,500MW



Hyatt Powerplant below Lake Oroville is in a cavern the size of two football fields.

Locally Funded Projects

- 600 cities and local agencies provide water through projects and imported supplies.
- Local systems include San Francisco's Hetch Hetchy project, East Bay Municipal Utility District's Pardee and Camanche Reservoirs, and Los Angeles' Owens Valley and Los Angeles Aqueducts.



- MWD of Southern California is the largest local district.
- Operates Colorado River Aqueduct.
- Other local projects serve farmers, such as Glenn-Colusa Canal in the Sacramento Valley.

Diamond Valley Lake (MWD photo)

Wild & Scenic Rivers

American River

- 1972 State Wild and Scenic Rivers Act - no dams or diversion facilities on the Smith River and parts of Klamath, Trinity, Van Duzen, Scott, Eel, Salmon, Feather and American.

- In 1980, some rivers under the Federal Wild and Scenic Rivers System.

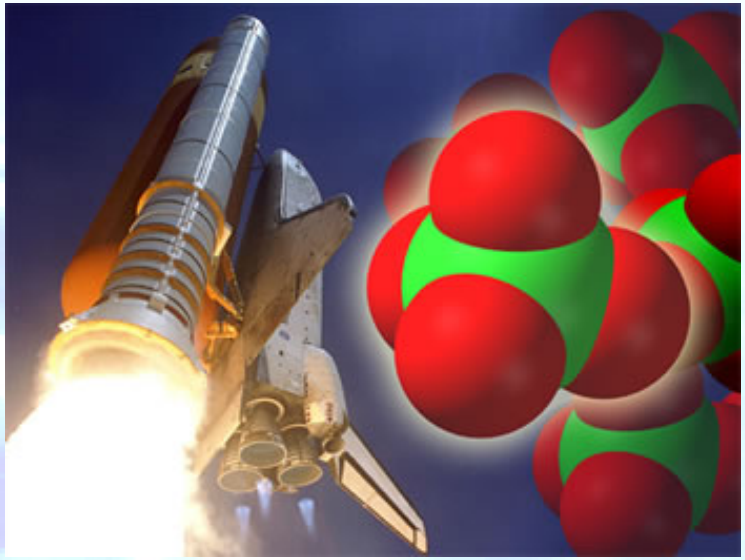
- Today parts of other rivers included

Perchlorate and Groundwater

More than 30 confirmed contaminant sites in California (March 2008)

- 12 sites impacted (about 538 water wells).
- 11 sites have caused the shutdown of drinking water wells

- **Where?** Mostly in Los Angeles, San Bernardino and Riverside Counties.



A naturally occurring and man-made chemical - the primary ingredient of solid rocket propellant

The Delta

The most important aspect of California's complicated water picture is the Delta, where the Sacramento and San Joaquin rivers meet.

Delta Water Quality Decisions

State Board sets salinity and flow objective to maintain Delta water quality:

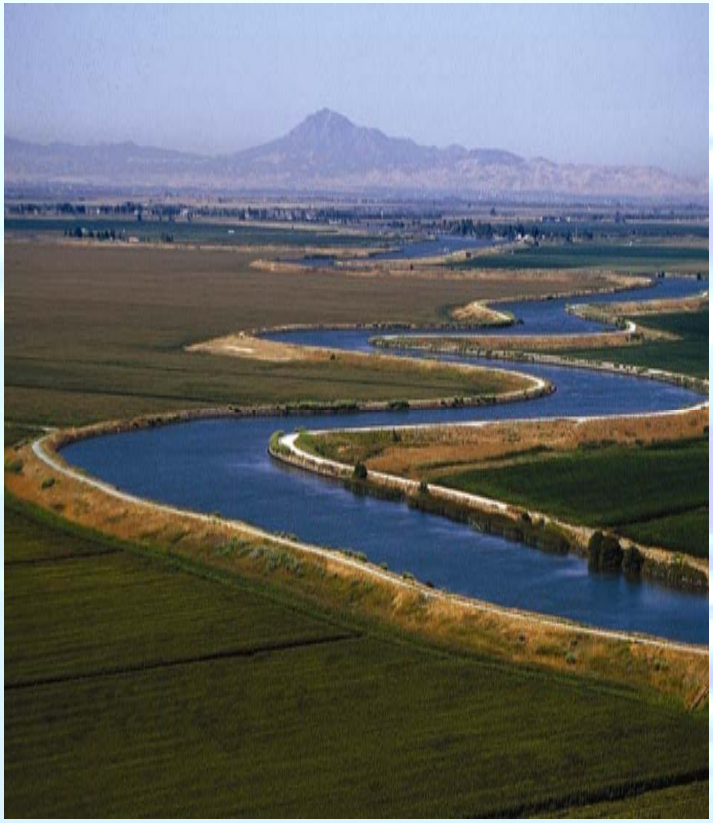
- 1978 – (D-1485) Water quality should be at least as good as if SWP and CVP not built

Federal State standoff on Delta flows led to Bay-Delta Accord and compromise standards.

- 1995 – (D 1641) adopted by State Board

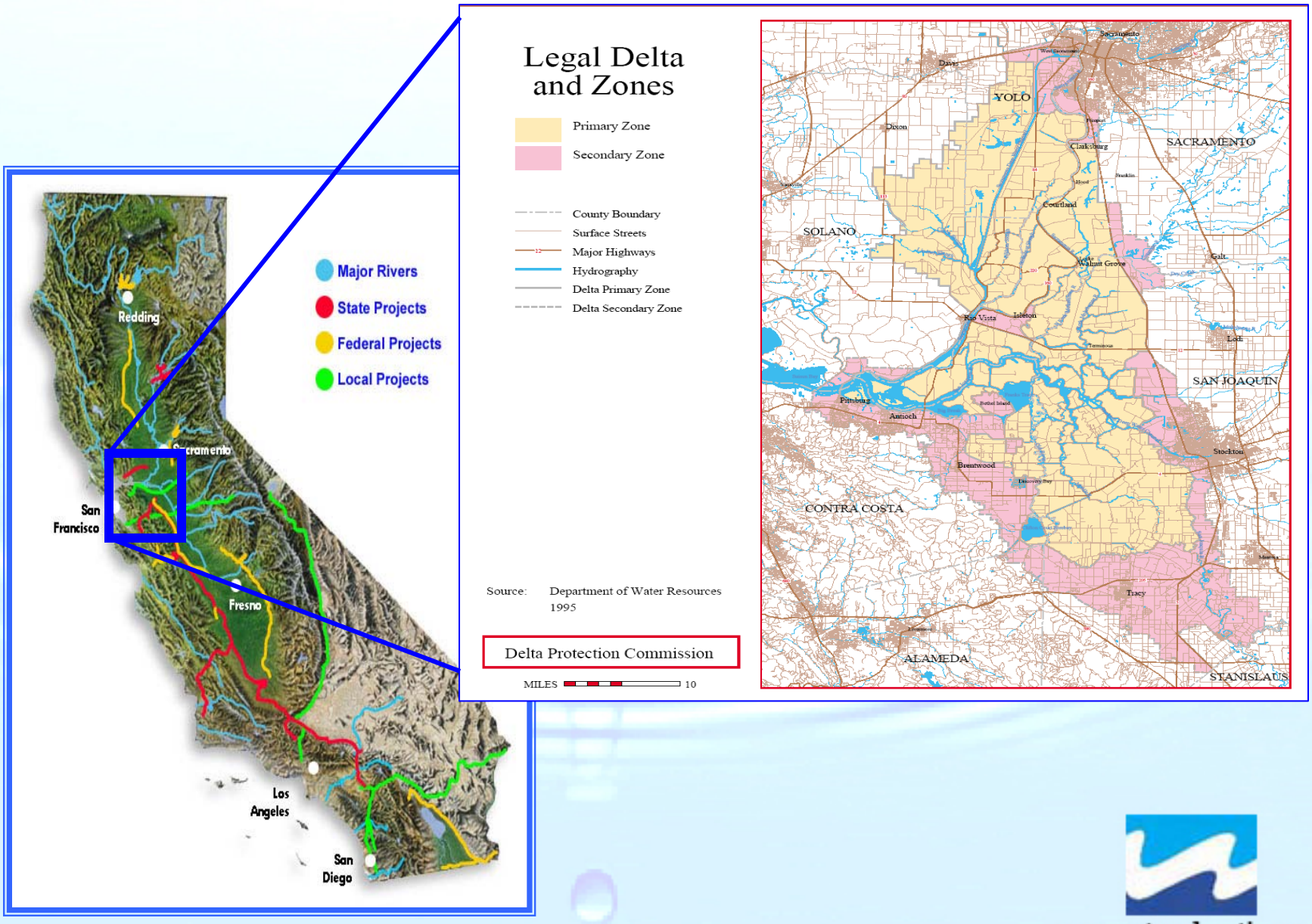
- 2006 – Delta Water Quality Control Plan that updates the 1995 plan. Agencies asked to help assist improving salinity objectives.

The Delta Affects Everybody



- 2/3 of all Californians rely on Delta water
- Irrigates 45% of fruits and vegetables grown in the U.S.
- 80% of commercial fish pass through Bay Delta. Habitat for 1700 species
- Delta levees - flood control and water quality protection
- Major recreation center and commerce pathway

Sacramento-San Joaquin Delta



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Importance of the Bay-Delta

100s Gas Lines

160,000 Homes

3 Highways

3 Railroads

5 Hi-Voltage Lines

CALFED

California Bay Delta Authority

- State and federal effort to solve Delta problems, formed in 1995
- 2000 Record of Decision with targets for 30-year program
- Concern that not every program has moved forward
- CALFED looking at conveyance facility plans

Delta Vision

Key Recommendations:
- Significant increase in conservation and water system efficiency
- New facilities to move and store water
- Reductions in the amount of water taken out

- **Gov's Blue Ribbon Task Force (2007)** - Premise that the ecosystem and a reliable water supply are co-equals
- 12 recommendations and actions
- Conflicts should be resolved by principles of Public Trust and Benefical Use.

Other Processes

Bay Delta Conservation Planning (BDCP)

Plan to get permits to pump water

-Set biological goals/objectives to guide initial plan development

- Developed the in-Delta and Suisun Marsh habitat restoration program

- Analyzed potential designs for the long-term conveyance system

Other Processes

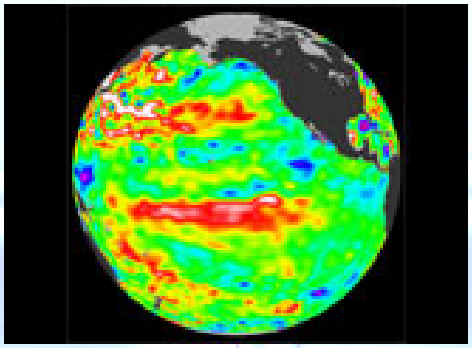
Delta Risk Management Strategy (DRMS)

Evaluated levees

Disastrous flooding estimates:
- 260 failures could be expected in next 100 years
- 12-15 simultaneous island failures in a major flood event
- 28% chance of 30 or more islands failing simultaneously in a major earthquake in the next 25 years.

- Island flood ranking - Delta islands evaluated for future viability

Climate Change – Planning for the Effects



- Predictions of 3˚C to 5˚C temperature increases to alter precipitation patterns, lose snowpack, extend dry season and produce more runoff during rainy season.
- Issue now being addressed by DWR, the State Water Board and other agencies

Total Maximum Daily Loads (TMDLs)

What is a TMDL?

Maximum amount of pollution that a waterway can hold before it's polluted

- Written plan describes how an impaired water body will meet water quality standards
- A description of required actions to remove impairments
- Allocation of responsibility in the form of actions – "who does what"

The federal Clean Water Act requires states to develop TMDLs for impaired waterbodies

Urban Runoff

Urban runoff flows – “dry weather” runoff - flows from storm drains in streets to creeks, lakes and rivers.

Pollutants enter storm drains

- Motor oil, pesticides, brake dust, pet waste, paint and household chemicals

Harmful effects of polluted runoff

- Degraded drinking water supplies
- Degraded recreational use and wildlife
- Beaches, lakes and creeks closed

Stormwater

Stormwater flows from urban areas and industrial or construction sites.

Past practices (hydromodification) – pavement, buildings, roads pick up pollutants and sends stormwater into drains to streams, rivers, ocean.

Key problems - Turbidity and soil degradation

Stormwater

Regulations

- The federal Clean Water Act requires operators of various industrial facilities, construction sites and urban areas to control the amount of pollutants entering their storm drain systems.

- The state board regulates industrial facilities and construction sites through general storm water permits.

- Cities and Counties are regulated through Municipal Separate Storm Sewer System (MS4) permits issued by the regional boards.

Salinity

Crisis in Central Valley

- Half of all irrigated land affected (400,000 acres).
- Evaporation ponds temporary solution (Tulare Lake Basin)
- About 113,000 acres on the west side of the San Joaquin Valley retired.
- Urban problem also.

  Salinity must be removed from wastewater

The water we use and release has a higher salinity concentration than what we started with.

Sea Water Desalination

About a dozen plants planned statewide

Carlsbad, Ca. - Developing facility of 50 million gallons per day. To start in 2010 at $909 per acre-foot.

- The reverse osmosis process consumes large amounts of energy and creates brine waste to be disposed of.

Appeal - recurrent droughts and uncertainties about future water supplies

Water Recycling

- Reusing treated wastewater:
  - agricultural and landscape irrigation
  - industrial recycling
  - groundwater recharge.
- Potable water - microfiltration and reverse osmosis
- Constraints for consumption - cost and public perception.

Potential to recycle up to 1.7 million acre-feet of water per year by the year 2030.

Conservation

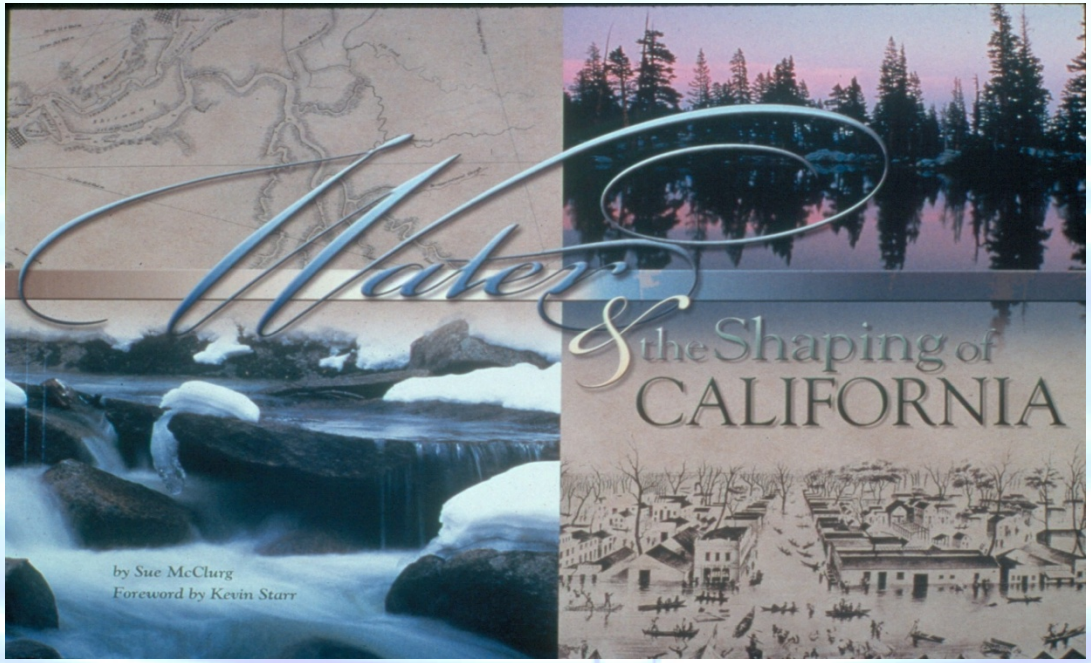
- **Urban**: Cities use same amount today as in the mid-1990s with 3.5 million more people.

Best Management Practices (BMPs) - installation of water-saving plumbing fixtures and water meters, public information programs, municipal landscape, financial incentives

Urban and agriculture conservation could reduce demand by about 1.2 million acre-feet

- **Ag**: BMPs, known as Efficient Water Management Practices (EWMPs) - construction and operation of tailwater reuse systems, automation of canal structures and installation of water meters.

“Water and the Shaping of California” is available from the Water Education Foundation



The Ultimate Water Book

“And it never failed that during the dry years the people forgot about the rich years, and during the wet years they lost all memory of the dry years. It was always that way.”
-John Steinbeck – East of Eden

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How You Can Get More Information

- Online briefing issues
- Announcements of events
- Schedule of workshops
- Catalog of materials

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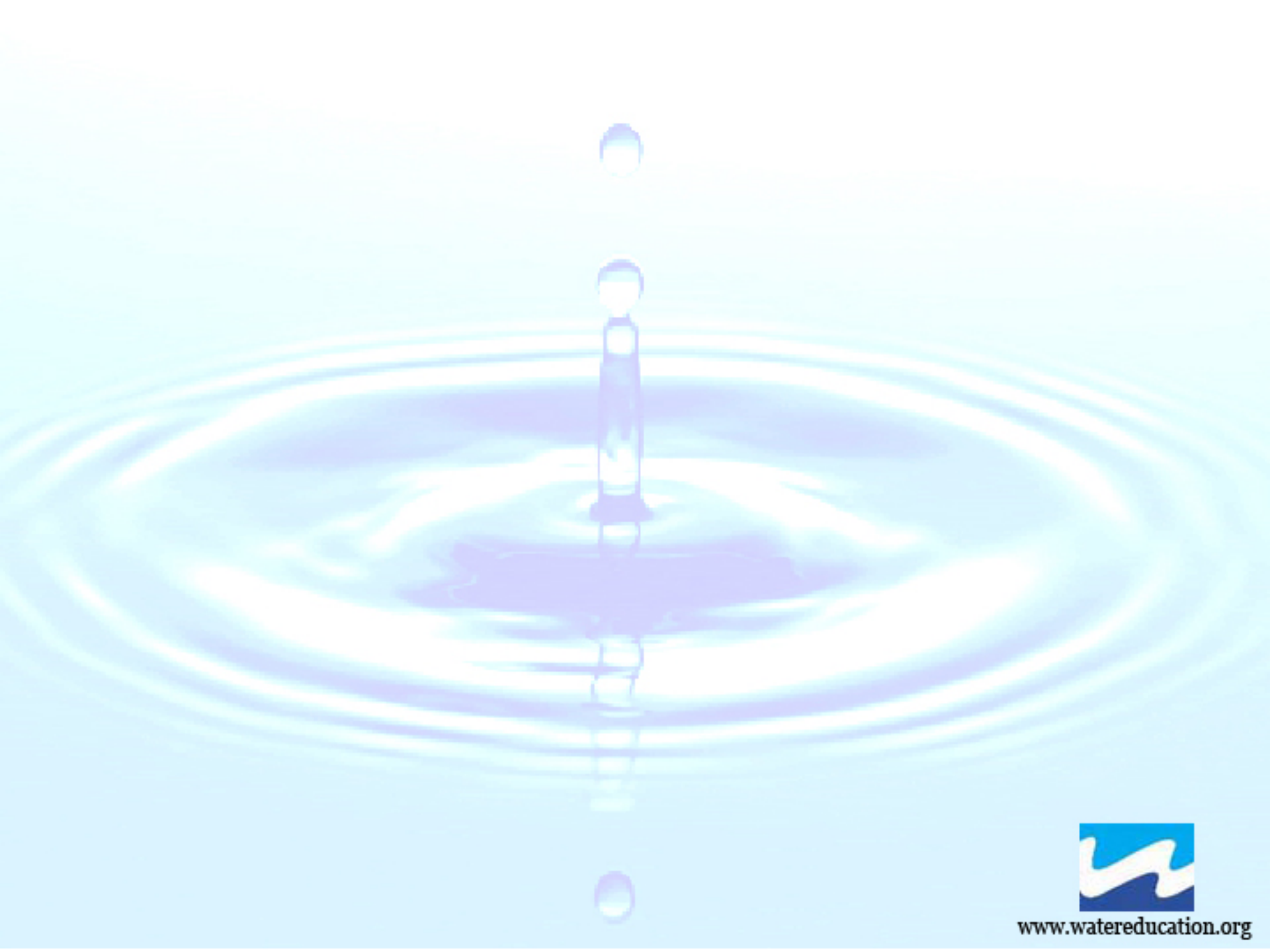

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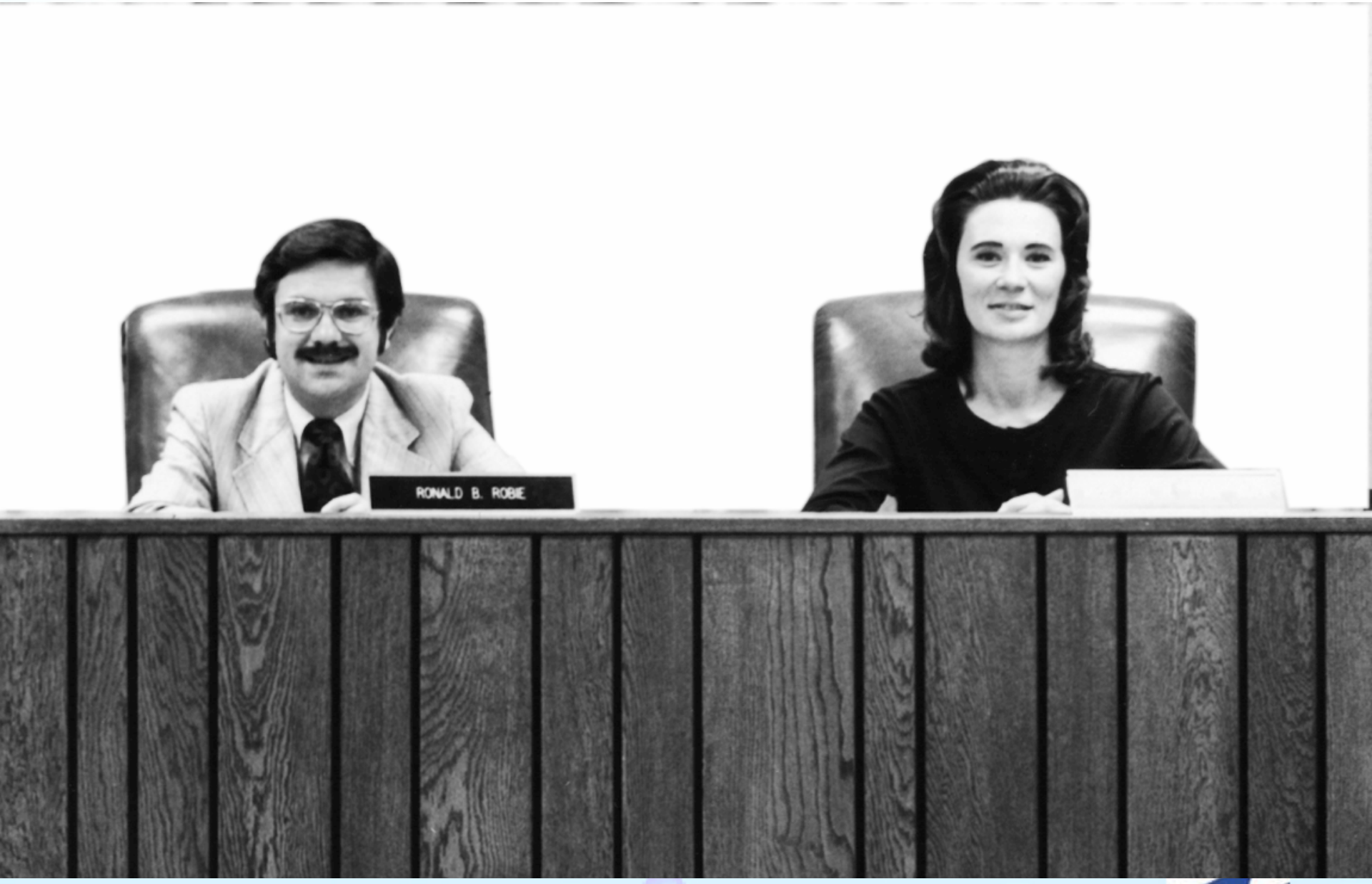
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